|  |  |
| --- | --- |
| AUTHOR: | CHRISTINE WILLIG, RUSTY BRESSER, KATHY MELANESE,  CHRISTINE SPHAR, CAROLYN FELUX |
| TITLE: | 10 WAYS TO HELP ELLS SUCCEED IN MATH |
| SOURCE: | *Instructor, 15320200, Mar/Apr2010, Vol. 119, Issue 5* |

10 WAYS TO HELP ELLS SUCCEED IN MATH. (2010). *Instructor*, *119*(5), 27-29.

Intended for teachers of mathematics at all levels, this article provides many ideas for teaching math to English Language Learners by incorporating reading into their instruction of mathematics. Many instructors believe that math is a universal language, but this is very untrue. There are many languages that have a different number system. Even countries that use the same numbers, many use different symbols. This year as an ELL math teacher, I found that none of my students knew the greater than or less than symbols. They also did not know the symbols used for addition, subtraction, multiplication and division. Additionally, when they took the Keystone exams, they were overwhelmed by the amount of English in all of the problems. Every math question on the Algebra keystone has over a sentence in English. My students were unable to do these problems and they were very discouraged.

Therefore, the authors of this article offer ways to scaffold instruction for ELLs and increase the English learning in the classroom. This is incredibly significant for all math teachers, because there are a growing number of ELLs in every classroom. The authors suggest using vocabulary banks on tests, potentially with pictures for the lower level ELLs. They emphasize the importance of using manipulatives in the classroom, which benefits all students, not just ELLs. They suggest that teachers speak more clearly and concisely and provide longer wait time for ELLs to translate and process in their second language. Additionally, they suggest that teachers use nonverbal queues, such as a thumbs up or down, which is something I always used in my classroom.

More suggestions include using sentence frames. Teachers could help students with these to help them answer problems in complete sentences. Again, this would help all of the students in the classroom, since most students struggle to write about math. The authors suggest that teachers design questions for varying levels of English proficiency. For instance, yes or no questions are easier for the lower levels, but questions that require students to describe or explain would require a higher level English comprehension. Teachers should also use prompts, such as: “I figured this out by…” Again, this will help all students explain their mathematical thinking, reinforce understanding and even check their work. When grouping students, teachers should consider both language ability and math ability. At times, the teacher should group based on language ability and other times math ability. Teachers should use partner talk, which encourages students to talk about math and use English. Choral response is another good way to encourage students to talk about mathematics and use math vocabulary.

All of these ideas would vastly improve any mathematics classroom, not only for ELLs but also for special education students and the general population. These ideas encourage students to get involved and talk about mathematics, which is essential to the new Common Core requirements. In my classroom this year, I used all of these ideas besides the sentence frames, which I realize would have been a tremendous help.

The authors discuss a resource for ELL teachers of k-5 and provide links to a website with videos, which was created in 2009. At the end of the article is a list of teacher tips from real teachers. These are all very helpful and encouraging for a math teacher teaching ELL students. There are many suggestions that corroborate the authors’ findings. Unfortunately, the authors did not include any pictures or graphs.

I chose this article, because I found that teaching ELL students made me a much better math teacher. If you change the title of this article to, “10 Ways to Incorporate Reading and Writing Into Math Education,” it would be just as relevant and important. All of these methods follow Common Core Standards, make the classroom more interesting, and help the teacher differentiate instruction.

**Activity:** **Math Stations**

*When I was teaching, math stations were both my and my students’ favorite activities. I would set up three stations using manipulatives and technology to reinforce the concepts taught that week. I would do math stations a day or two before a big test.*

Students will be broken up into groups of 4 based on language ability (suggestion from author). The students will use manipulatives and technology, which was a great suggestion from the authors.

**Objective:** Students will be able to multiply and divide fractions.

**Essential questions:** When do we multiply and divide fractions in real life? When you divide a number by a fraction, why does it get bigger? When you multiply by a fraction, why does it get smaller?

**Station #1: Graham Cracker Division**

Rules: At this station, students will follow a worksheet and break up graham crackers to divide by fractions. For instance, the first question says 2 divided by ¼. The students will then take 2 graham crackers and break them into fourths. They will find that they have 8 pieces. They will then check their work by multiplying by the reciprocal. They will then see why when they divide by a fraction, their answer is larger.

**Station #2: Baking with Fractions**

Rules: At this station, students will find cookies, their recipe, and a worksheet. This cookie recipe makes 20 cookies. The worksheet will ask the students to double this recipe and rewrite it. Then students will need to halve it by dividing by 2 or multiplying by ½. They will see that this is the same thing. Lastly, students will need to figure out what they need to do to make 15 cookies, which is multiply by ¾.

**Station #3: GAMES!**

Students will get a laptop at this station, which is already on a Pirates multiply and divide fractions test! They will complete this test as many times as possible and provide their highest score on their worksheet. This will give students practice with multiplying and dividing fractions.

After completing all three stations, students will complete the following sentences using the word bank (bigger, smaller, reciprocal):

1. When you divide a number by a fraction, it gets \_\_\_\_\_\_\_\_\_\_.
2. When you multiply a fraction, it gets \_\_\_\_\_\_\_\_\_.
3. In order to divide by a fraction, you multiply by its \_\_\_\_\_\_\_\_\_\_\_.

Then they will complete the sentence frame: (Dictionaries provided and encouraged)

People multiply by fractions, when they are….

People divide by fractions, when they are….

The authors suggested the use of word banks and sentence frames to encourage ELLs to write about math. They also suggested that teachers design sentences for different proficiency levels. Since these students are ESOL 1, these are very appropriate, whereas the last two sentences would be more difficult for these students (and graded more leniently).